

## REMARKS:

Claims **1-21** were examined in this reissue application. Claims **1, 6, 7, 15, and 16** include claim amendments. Aside from the preliminary claim amendment accompanying the reissue request, the Applicant submits that the other amendments merely make explicit that which was implicit in the claims as originally filed. As such, no new matter has been entered. The Applicant submits that the amendments are being done to improve readability and do not represent a narrowing of any feature of the claims. Furthermore, the Applicant submits that these amendments do not narrow the scope of any claim limitation within the meaning of the decision in *Festo*.

## CLAIM REJECTIONS:

### 35 USC 112 Rejections

#### Rejection of Claims 1-18

Claims **1-18** were rejected under 35 USC 112 first paragraph regarding the enablement for “not including water and acid in making the material.” This rejection is traversed.

Applicant notes that, for enablement purposes, the understanding of those of skill in the art is not limited to the working examples of the present application cited by the Office (which are nonlimiting, exemplary embodiments) but includes the knowledge available in the prior art. Per MPEP 2164.05, whether the specification would have been enabling as of the filing date involves consideration of the nature of the invention, the state of the prior art, and the level of skill in the art. The state of the prior art is what one skilled in the art would have known, at the time the application was filed, about the subject matter to which the claimed invention pertains. The relative skill of those in the art refers to the skill of those in the art in relation to the subject matter to which the claimed invention pertains at the time the application was filed. See MPEP § 2164.05(b).

More specifically, per MPEP 2164.08, not everything necessary to practice the invention need be disclosed. In fact, what is well-known is best omitted. *In re Buchner*, 929 F.2d 660, 661, 18 USPQ2d 1331, 1332 (Fed. Cir. 1991) and MPEP 2165.05(a) (the specification need not disclose what is well-known to those skilled in the art and preferably omits that which is well-known to those skilled and already available to the public). All that is necessary is that one

skilled in the art be able to practice the claimed invention, given the level of knowledge and skill in the art.

With the foregoing in mind, to show the state of the prior art, Applicant directs the Office to the present patent application which cites U.S Patent 5,858,457 by Brinker in the Background of the Invention. U.S Patent 5,858,457 by Brinker describes that a precursor sol used in self-assembly may be prepared containing a soluble source of a metal oxide, water, an organic solvent, surfactant, and acid or base catalyst, wherein the surfactant concentration is much less than the critical micelle concentration and the surfactant is present as free surfactant (see claim 1 of the '457 patent). Clearly, the preparation of a precursor sol as understood in the art involves knowledge that such precursor sols in self-assembly processes are *NOT* limited to those sols formed only from acid and water. In the examples of the present application, e.g. composition A2\*\*, a sol is a catalyzed hydrolyzed solution of TEOS and by definition includes water and a catalyst (which as evidenced by U.S Patent 5,858,457 is understood by those of skill in the art could be an acid or a base). See also *Acid and Base Catalysts in the Hybrid Silica Sol-Gel Process* by Cesar R. Silva and Claudio Airoidi in Journal of Colloid and Interface Science, Volume 195, Issue 2, 15 November 1997, Pages 381-387 or *A catalyst-free approach for sol-gel synthesis of highly mixed ZrO<sub>2</sub>-SiO<sub>2</sub> oxides* by ZHAOQI ZHAN and ZENG H. C. in the Journal of non-crystalline solids, 1999, vol. 243, no1, pp. 26-38. As such, acid or base catalysis and even non-acid/non-base catalysis are understood in the art.

Based on the foregoing patent and other papers cited in the present application, Applicant respectfully submits that it is within the reasonable level of skill in the art to practice the claimed invention in sols prepared in other than acid and water as such practice with a non-acid catalyst is documented in the art. In light of the significant number of papers in the sol-gel area (ISI Web of Knowledge: 36,838 publications with topic "sol-gel" as of 26 May 2008), the level of skill in the art is high. Furthermore, claim 1 as originally filed does not include the limitations to acid and water and should not be limited to just those components. Accordingly based on MPEP 2164.05 and the cited documents, Applicant respectfully traverses the rejection that claims 1-18 are only enabled for embodiments based on acid and water.

#### Rejection of Claim 15

Claim **15** was rejected under 35 USC 112 first paragraph regarding the enablement for use of aerosol processing in claim 15. Applicant respectfully traverses this rejection.

As stated in the present application at Col. 2, lines 22-25, “evaporation of a portion of the solvent, such as can occur during coating onto a substrate or **during aerosol processing** or spray drying, forms a liquid-phase crystalline mesophase material.” (emphasis added) This sentence expands on the prior sentence at Col. 2, lines 16-21 which describes formation of a thin film. As this combination supports the language in claim 15, regarding the evaporation of a portion of the solvent using an aerosol process, claim 15 is fully supported and one of skill in the art would understand that aerosol processing can also be used to form such material, as a film or particle. The aerosol process can in fact be used to form completely conformal films on any support. The aerosol particles coalesce on the surface to form a defect free film as has been documented in several membrane journal articles. See for example, *Aerosol-assisted deposition of surfactant-templated mesoporous silica membranes on porous ceramic supports*, Microporous and Mesoporous Materials, Volume 66, Issue 1, 18 November 2003, Pages 91-101 (G. Xomeritakis, C. M. Braunbarth, B. Smarsly, N. Liu, R. Köhn, Z. Klipowicz and C. J. Brinker). Applicant submits that aerosol deposition is well known for film formation. Accordingly, Applicant respectfully traverses the rejection that claim 15 and requests that the rejection be withdrawn.

#### Rejection of Claim 18

Claim 18 has been rejected based on the enablement of the claim language “hydrophobic molecule”. Applicant respectfully traverses the rejection.

As acknowledged by the Office, the present application already discloses hydrophobic organic polymers as an interstitial compound. Claim 18 recites the term “an organic molecule” and Applicant notes that claims as filed are considered part of the specification. The present application further states at Col. 2, line 31, that the **interstitial compound can be inorganic or organic**. It seems from the above that it is within the skill of those of skill in the art to use an organic or inorganic hydrophobic material and should not be limited to only hydrophobic organic materials. Furthermore, Applicant notes that the term “swelling agent” at Col. 6, lines 29-30 is not restricted in the specification to be an organic or inorganic composition.

MPEP 2163(II)(A)(3)(a) states that “The written description requirement for a claimed genus may be satisfied through sufficient description of a representative number of species”. The same MPEP section goes on to state that:

A "representative number of species" means that the species which are adequately described are representative of the entire genus. Thus, when there is substantial variation within the genus, one must describe a sufficient variety of species to reflect the variation within the genus. The disclosure of only one

species encompassed within a genus adequately describes a claim directed to that genus only if the disclosure "indicates that the patentee has invented species sufficient to constitute the gen[us]." See *Enzo Biochem*, 323 F.3d at 966, 63 USPQ2d at 1615; *Noelle v. Lederman*, 355 F.3d 1343, 1350, 69 USPQ2d 1508, 1514 (Fed. Cir. 2004) (Fed. Cir. 2004)

In addition, MPEP 2163(II)(3)(b) makes it clear that disclosure of a species can support a genus even if the claim is new or amended. Specifically:

When an explicit limitation in a claim "is not present in the written description whose benefit is sought it must be shown that a person of ordinary skill would have understood, at the time the patent application was filed, that the description requires that limitation." *Hyatt v. Boone*, 146 F.3d 1348, 1353, 47 USPQ2d 1128, 1131 (Fed. Cir. 1998).

Furthermore, the embodiments of the interstitial compounds include, but are not limited to, organoalkoxysilanes, proteins, dyes, and metal-containing compounds (Col. 3, lines 46-52). The presence of these inorganic and organic compounds in the hybrid mesophase structure of the present invention allow these materials to be used in sensor applications, as low dielectric constant films, as photonic materials and as optical hosts.

Accordingly, Applicant submits that there is sufficient support for the genus of "hydrophobic molecules" as the interstitial material may be both organic or inorganic hydrophobic molecules, the generic term swelling agents is used, and that one reading the specification would understand that the present claim should not be limited to only hydrophobic organic polymers. As such, Applicant respectfully traverses the rejection of claim 18.

#### Rejection of Claim 1-21

Claims **1-21** was rejected under 35 USC 112 first paragraph regarding the enablement based on ambiguity over the term A2\*\*. Applicant respectfully traverses this rejection.

Applicant directs the Office to Col. 4, lines 53-55 which clearly defines that A2\*\* is a representative silica sol comprising water TEOS acid ethanol. Accordingly, Applicant respectfully submits that this rejection has been traversed.

#### Rejection of Claims 6, 12, 15, 16, 18

Claims **6, 12, 15, 16, and 18** were rejected under 35 USC 112 second paragraph as being indefinite. This rejection is traversed in part and overcome in part.

Claims 6, 15, and 16 have been amended to correct for antecedent basis. Rejections for those claims have been overcome.

With regards to claim 12, the ammonia vapor exposure could come before or after the heating step, and as such, Applicant submits that the claim is sufficiently clear to one of skill in the art. Per MPEP 2173.04, breadth of a claim is not to be equated with indefiniteness. In re Miller, 441 F.2d 689, 169 USPQ 597 (CCPA 1971). If the scope of the subject matter embraced by the claims is clear, and if applicants have not otherwise indicated that they intend the invention to be of a scope different from that defined in the claims, then the claims comply with 35 U.S.C. 112, second paragraph. In the present claim, vapor exposure could occur before or after and Applicant submits that such a claim would be understood by those of skill in the art.

With regards to claim 15, Applicant submits that claim 15 is fully supported by the language in the application stating that at Col. 2, lines 22-25, “Because the surfactant is at a concentration less than the critical micelle concentration, evaporation of a portion of the solvent, such as can occur during coating onto a substrate or during aerosol processing or spray drying, forms a liquid-phase crystalline mesophase material.” (emphasis added). If there is some ambiguity regarding this description and how solvent evaporation may occur (which Applicant believes should be clear to those of skill in the art), Applicant requests that the Office more clearly set forth the exact area of ambiguity so that Applicant may address any such deficiency.

With regards to claim 18, applicant submits that the term hydrophobic only applies to the term “a hydrophobic molecule” as the other terms in the claim both start with the article “a” or “an”. The term hydrophobic as used in claim 18 is an adjective that modifies only the term “molecule”.

#### Double Patenting

In response to the nonstatutory obviousness-type double patenting rejection, Applicant submits that the cited patent 6,270,846 is commonly owned and was filed on the same day as the current application. As the cited reference and the current application are filed on the same day and neither have a patent term adjustment, there is nothing to disclaim. Per MPEP 1405, the maximum term of the original patent is fixed at the time the patent is granted. Accordingly, this rejection is moot as there cannot be any extension of time which the Applicant can disclaim.

**CONCLUSION:**

For the reasons set forth above, the Applicant submits that all claims are allowable over the cited art and define an invention suitable for patent protection. The Applicant therefore respectfully requests that the Office enter the amendment, reconsider the application, and issue a Notice of Allowance in the next Office Action.

Respectfully submitted,

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